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Artemisia spicigera Essential Oil: Assessment of Phytochemical and Antioxidant Properties

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Abstract

Background: Essential oils (EO), also called volatile odoriferous oil, are aromatic oily liquids extracted from different parts of plants. In general, the constituents in EOs are terpenes, aromatic compounds (aldehyde, alcohol, phenol, methoxy derivatives, and so on), and terpenoids (isoprenoids). Essential Oils have been known to possess antioxidant and antimicrobial activities, thereby serving as natural additives in foods and food products.

Objectives: The aim of this study was to assess the quantity and quality of compounds, with active chemical and antioxidant properties, of *Artemisia spicigera* essential oil (EO) due to the effect of geographic location and season of harvest on the phenolic compounds of the plant. The plant was collected from east Azarbayjan province, Iran (both before and after the flowering stage).

Materials and Methods: *A. spicigera* EO was analyzed by gas chromatogram/mass spectrometry (GC-MS). The antioxidant activity and total phenolic content before and after flowering were evaluated by the Folin Ciocalteu method. Also, the yields of essential oil as a percentage based on the level of dry plant and the volume of extracted oil was determined.

Results: Analysis of *A. spicigera* EO by gas chromatogram-mass spectrometry showed that spachulenol 1 H cycloprop (18.39%) and bicyclo hexan-3-en, 4-met (26.16%), were the prominent EOs of *Artemisia* before and after the flowering stage; the total phenolic EO before and after the flowering stage was 23.61 ± 1.08 μg/mL and 17.71 ± 0.9 μg/mL, respectively. Also level of flavonoid content before and after the flowering stage was 37.27 ± 1.70 μg/mL and 29.04 ± 1.30 μg/mL, respectively. This EO was able to reduce the stable free radical 2, 2-diphenol,1-picryl hydrazyl (DPPH) with an IC_{50} of 86.14 ± 2.23 and 96.18 ± 2.61 μg/mL, before and after flowering, respectively. Yield of EO before and after flowering was 0.5% and 0.6%, respectively.

Conclusions: Results have shown that *A. spicigera* EO before and after flowering has antioxidant properties and therefore can be used in combination with other preservatives to protect food materials against a variety of oxidative systems.

Keywords: Essential Oils, Antioxidants, Gas Chromatography, *Artemisia spicigera*